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Notes on Two Japanese Species of *Tetranychus* (Acarina: Tetranychidae)

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江原　昭三[1]・真崎　誠[2]: *Tetranychus* に属する日本産の2種のハダニについて

Abstract: *Tetranychus ludeni* ZACHER, previously referred to *T. desertorum* BANKS in Japan, was redescribed and figured. And besides, notes on the identification of *T. kanzawai* KISHIDA were presented.

Spider mites of the genus *Tetranychus* DUFOUR are mostly polyphagous, and many of them are of economic importance. Nine species of *Tetranychus* have hitherto been recorded from Japan. Among the Japanese members a species which was previously identified with *T. desertorum* BANKS by the senior author (EHARA, 1956) is referred to *T. ludeni* ZACHER in the present paper. *T. ludeni* is redescribed and figured here. Incidentally, notes on a common species *T. kanzawai* KISHIDA are presented.

Tetranychus ludeni ZACHER

(Figs. 1-13)

Tetranychus ludeni ZACHER, 1913, p. 40, Fig. 3; PRITCHARD & BAKER, 1955, p. 405, Figs. 355-358; MEYER, 1974, p. 245, Figs. 1007, 1210-1212; WANG, 1981, p. 112, Fig. 99a.
Tetranychus (*Tetranychus*) *ludeni*, JEPPSON et al., 1975, p. 227, Figs. 46i, 48b.
Tetranychus desertorum BANKS: EHARA, 1956, p. 144, Figs. 22-30; EHARA, 1960, p. 238; EHARA, 1962, p. 106; EHARA, 1966, p. 19, Fig. 48; EHARA, 1980, p. 287, Fig. 131-B. Misidentification.

Female. Body, including rostrum, 512 μm long, 329 μm wide. Dorsal setae of idiosoma slender, pubescent, longer than distance between consecutive setae. Hysterosoma with longitudinal striae between pair of setae C_3 and between pair of C_4, forming a diamond-shaped figure between these setae; lobes on dorsal hysterosomal striae triangular, pointed apically, mostly taller than broad. Peritremes with distal part hooked. Genital flap with transverse striae; area immediately anterior to flap

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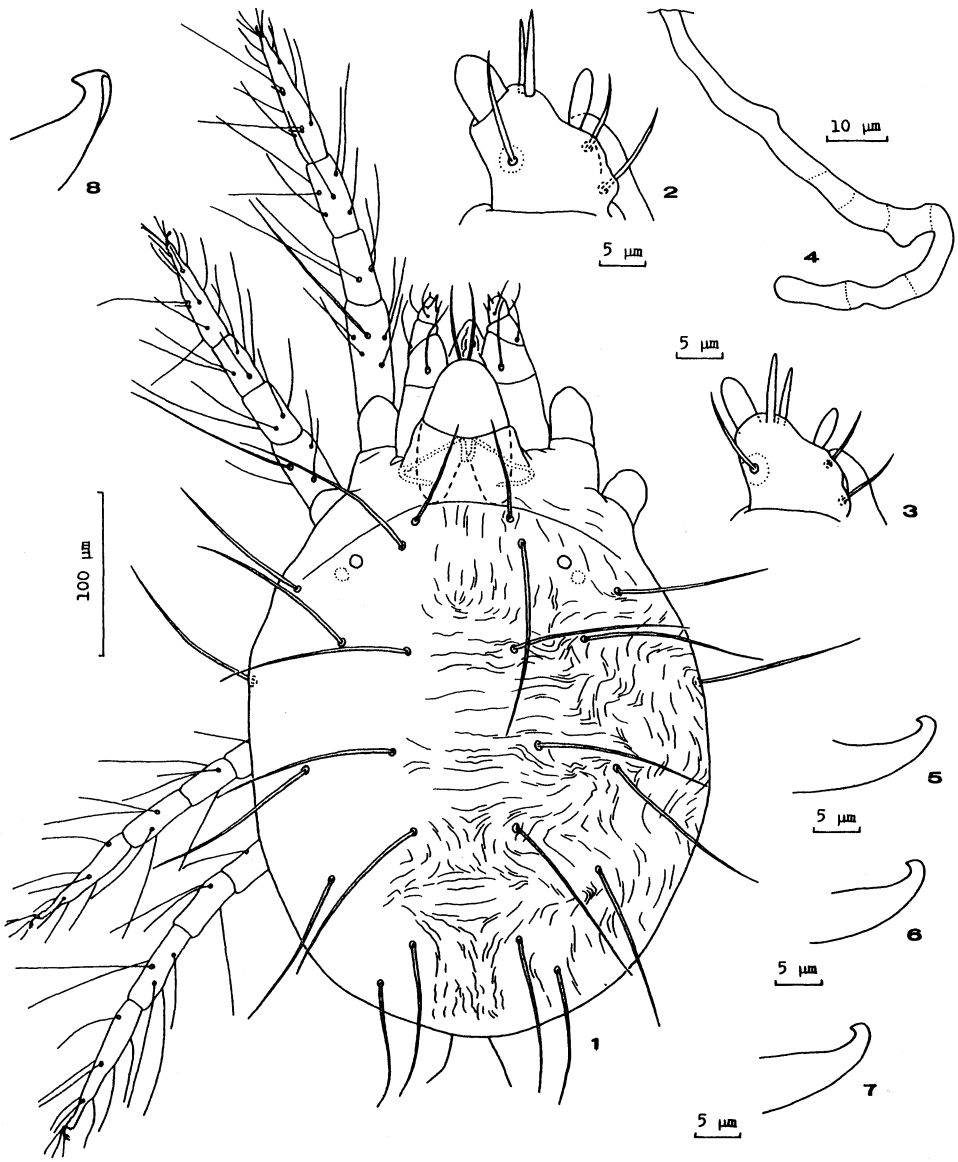
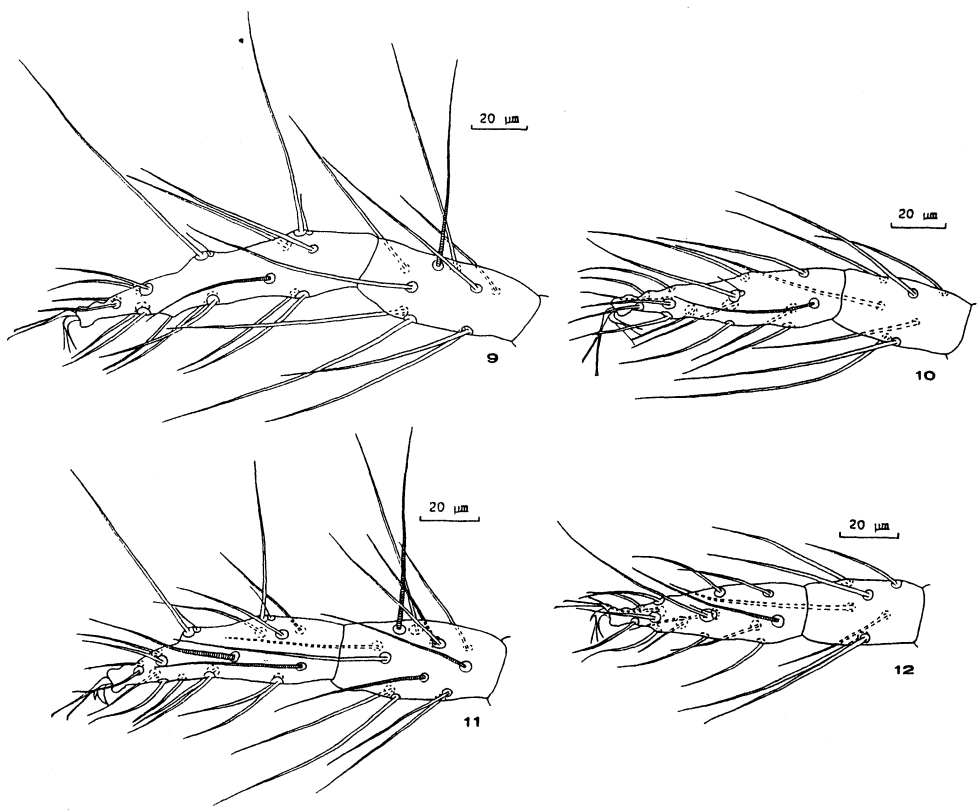
with longitudinal striae. Palpus with terminal sensillum about one and half times as long as broad; dorsal sensillum typically fusiform, subequal in length to the terminal. The number of setae and solenidia (in parentheses) on leg segments: femora 10-6-4-4, genua 5-5-4-4, tibiae 9(1)-7-6-7, tarsi 13(1)+2 dupl.-13(1)+1 dupl.-9(1)-10(1). Tarsus



Figs. 1-8 *Tetranychus ludeni*. 1: Dorsum of female. 2: Distal segment of palpus of female. 3: Distal segment of palpus of male. 4: Peritreme of female. 5-7: Aedeagi. 8: Distal part of aedeagus (schematic, much magnified).

I with two sets of duplex setae widely separated, the proximal set more or less on a line with 4 tactile setae; tarsus II with 3 tactile setae and 1 solenidion proximal to duplex setae. Each empodium with a minute mediodorsal spur.

Male. Body, including rostrum, 431 μm long, 214 μm wide. Aedeagus gradually bent dorsad; terminal knob a little longer than the width of neck which is less than one fifth as long as dorsal margin of shaft; anterior projection of knob acute; posterior part of knob with projection absent, interiorly having a ventrally directed, ridge-like projection. Palpus of terminal sensillum approximately twice as long as broad, dorsal sensillum fusiform, shorter than the terminal. The number of setae and solenidia (in parentheses) on leg segments: femora 10-6-4-4, genua 5-5-4-4, tibiae 9(4)-7-6-7, tarsi 13(3)+2 dupl.-13(1)+1 dupl.-9(1)-10(1). Tarsus I with 3 tactile setae and 2 solenidia proximal to proximal set of duplex setae, with 1 tactile seta at the same level of the proximal duplex set; tarsus II with 3 tactile setae and 2 solenidia. Empodium I consisting of a strong mediodorsal spur and 2 much larger proximoventral spurs. Empodia II-IV each with a strong mediodorsal spur.



Figs. 9-12 *Tetranychus ludeni.* 9: Tarsus and tibia I of female. 10: Tarsus and tibia II of female. 11: Tarsus and tibia I of male. 12: Tarsus and tibia II of male.

New collections. Nine ♂♂ & 14♀♀, Naka-ku, Yokohama, 3-X-1988 (M. MASAKI), on *Brassica campestris* L. var. *perviridis*; 1♂ & 1♀, Isogo-ku, Yokohama, 15-VII-1988 (M. M.), on perilla; 3♂♂ & 2♀♀, Naka-ku, Yokahama, 20-VI-1989 (M. M.), on potato; 8♂♂ & 10♀♀, Naka-ku, Yokohama, 15-VII-1989 (M. M.), on *Cardiospermum halicacabum* L.

Remarks. Prior to the present study this mite was called *T. desertorum* in Japan, but it should be referred to *T. ludeni*. *T. ludeni* is widespread in the world, and is found on a wide variety of agricultural crops and wild plants. As for Japan, "*T. desertorum*" was previously recorded from Hokkaido (in greenhouse), Honshu, Shikoku, Kyushu, and Okinawa Island, on *Bidens*, cucumber, eggplant, *Gerbera*, marigold, melon, *Phaseolus*, soybean, and *Tagetes*.

Tetranychus kanzawai KISHIDA

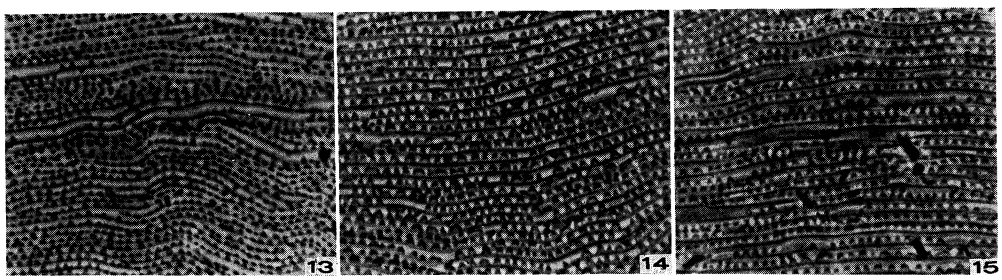
(Fig. 14)

Tetranychus kanzawai KISHIDA, 1927, p. 105; EHARA, 1956a, p. 504, Figs. 15-25.

"*Tetranychus atlanticus* MCGREGOR" was recorded from Japan by PRITCHARD and BAKER (1955) on the basis of J. FUKUDA's specimens that were collected on apple at Okitsu, Shizuoka Prefecture. The record was followed by JEPPSON et al. (1975). However, it is possible that FUKUDA's specimens are not *T. turkestani* (UGAROV et NIKOLSKI) (=*T. atlanticus* MCG.), but *T. kanzawai* KISHIDA which is very common on various kinds of cultivated and wild plants in Shizuoka Prefecture.

Although the aedeagi of *kanzawai* and *turkestani* are close to each other, the summer females of *kanzawai* are dark red in color, while those of *turkestani* are well known as being greenish or straw-colored (PRITCHARD and BAKER, 1955). Furthermore, the overwintering females are vermilion in *kanzawai* but orange in *turkestani*.

None of Japanese specimens of *turkestani* have been examined by the senior author (S. E.).



Figs. 13-15 Photomicrographs of lobes on dorsal hysterosomal striae (female), ×ca. 800. 13: *Tetranychus ludeni*. 14: *T. kanzawai*. 15: *T. hydrangeae*.

T. kanzawai is more similar to another exotic mite, *T. hydrangeae* PRITCHARD et BAKER, in the reddish color of the body (PRITCHARD and BAKER, 1955), than to *T. turkestani*. A few specimens of *hydrangeae* from the United States, offered by Dr. E. W. BAKER, have been examined in the present study.

The lobes on the dorsal hysterosomal striae and the empodia of *kanzawai* are found to resemble those of *hydrangeae*. In *kanzawai* the lobes are mostly of finger-ends (Fig. 14), whilst in *hydrangeae* the lobes are bluntly pointed or rounded at the apices (Fig. 15).

In *kanzawai* empodia III and IV each of the male is provided with a tiny to considerably large mediodorsal spur, and each empodium of the female bears a minute mediodorsal spur. In *hydrangeae* each of empodia III and IV of the male and of empodia I to IV of the female has a tiny mediodorsal spur.

In short, the two allied species are distinguished only by the shape of the aedeagi. The difference of the aedeagus between *kanzawai* and *hydrangeae* was indicated by EHARA and WONGSIRI (1975), and EHARA and THO (1988).

T. kanzawai is a major mite pest of many cultivated plants in Japan, and it has also been confirmed to occur in China, Taiwan, and Malaysia. It is probable that *kanzawai* and *hydrangeae* have been confused by a lot of workers of the world.

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摘　　要

アシノワハダニ *Tetranychus ludeni* ZACHER が再記載された。アシノワハダニの学名は，従来 *T. desertorum* BANKS とされてきたが，正しくは *T. ludeni* が用いられるべきである。真の *T. desertorum* は，未だ日本からは見いだされていない。

カンザワハダニ *Tetranychus kanzawai* KISHIDA と近似種 *T. turkestani* (UGAROV et NIKOLSKI) (=*T. atlanticus* MCGREGOR) 及び *T. hydrangeae* PRITCHARD et BAKER との相違点が記述された。

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